

4,568,737;

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~~4,568,77~~; 4,587,329; 4,631,337; 4,558,120; 5,714,166; 5,338,532, and in Dendrimers and other Dendritic Polymers, eds. by J.M.J. Frechet, D. A. Tomalia, pub. John Wiley and Sons, (2001).

A scaffolding core is one where the simple core has other moieties or entities attached which then serve as the platform for the dendritic polymer growth to the first generation. Examples of scaffolding cores include, but are not limited to, capped materials, such as trimethyltriacrylate capped with piperazine, PETGE capped with aminoethylpiperazine, TMPTGE capped with piperazine or aminoethylpiperazine, di-imminodiacetic acids, epoxide surface PEHAMS.

A super core is where a dendrimer serves as the core functionality and other dendritic structures may be attached or grown from its surface or a gold particles or colloids, latex, metal oxides, micelles, vesicles, and liposomes, buckyballs, carbon nanotubes (single and double wall), carbon fibers, silica. Some examples of super cores are PAMAM with a PEHAM grown on its surface, PEHAM core with PEHAM and PAMAM grown on its surface.

Cores have at least one nucleophilic or one electrophilic moiety; or a polyvalent core bonded to at least two ordered dendritic branches; or a core atom or molecule that may be any monovalent or monofunctional moiety or any polyvalent or polyfunctional moiety, preferably a polyfunctional moiety having 2-2300 valence bonds of functional sites available for bonding with dendritic branches.

Nucleophilic core examples include ammonia, water, hydrogen sulfide, phosphine, poly(alkylenediamines) such as ethylenediamine, hexamethylenedamine, and dodecyl diamines, polyalkylene polyamines such as diethylenetriamine, triethylenetetraamine, tetraethylenepentaamine, linear and branched polyethyleneimine, primary amines such as methylamine, hydroxyethylamine, octadecylamine, polymethylenediamines, macrocyclic polyamines, polyaminoalkylarenes, tris(aminoalkyl)amines, heterocyclic amines, and other various amines. Other nucleophilic cores are ethylene glycol, polyalkylene polyols, polyalkylene polymercaptans, thiophenols and phenols.

Examples of electrophilic cores include cyclic ethers (epoxides), oxiranes, cyclic sulfides (epichlorosulfide), aziridines, azetidines, siloxanes, oxetanes, oxazolines, oxazines, carbamates, caprolactones, carboxyanhydrides, thiolactones, beta-lactams, alpha-beta-ethylenically unsaturated carboxylic esters such as methylacrylate, ethylacrylate,